U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Renewable Power Purchases and Renewable Energy Certificates (RECs)

June 23, 2011

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FEMP
Federal Energy Management Program

Course Objectives

Describe the different options available to Federal agencies to meet Federal renewable energy goals.

Provide detailed information on renewable power and renewable energy certificate (REC) purchases.

Overview

- Federal Renewable Energy and Greenhouse Gas (GHG) Goals
- Options for Meeting Renewable Energy Goals
- Renewable Power/REC Purchase Benefits
- REC Definition and Overview
- Purchasing Renewable Power in a Competitive Electricity Market
- Regulated Utility Green Pricing Programs
- REC Detailed Overview and Procurement Options
- Counting Renewable Power/REC Purchases Toward GHG Goals
- Additional Resources

Federal Renewable Energy Requirements

Regulation	Produce, Use, or Both	Requirement Level
Energy Policy Act (EPAct) of 2005*†	Use, Electric	• 3% FY 2007-2009 • 5% FY 2010-2012 • 7.5% FY 2013…
Executive Order (E.O.) 13423	Use, All RE	50% EPAct 2005 Goal must come from "new" sources (1999 and newer)
E.O. 13514 (Section 9)	Use, All RE	Individual GHG agency goals

** Defines "renewable energy" as* **electric energy** *generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.*

† A double bonus exists for renewable projects on Federal or Native American land. This bonus is for the renewable goal only; it does not apply towards the GHG goal.

Agency Progress Toward Renewable Energy Goal

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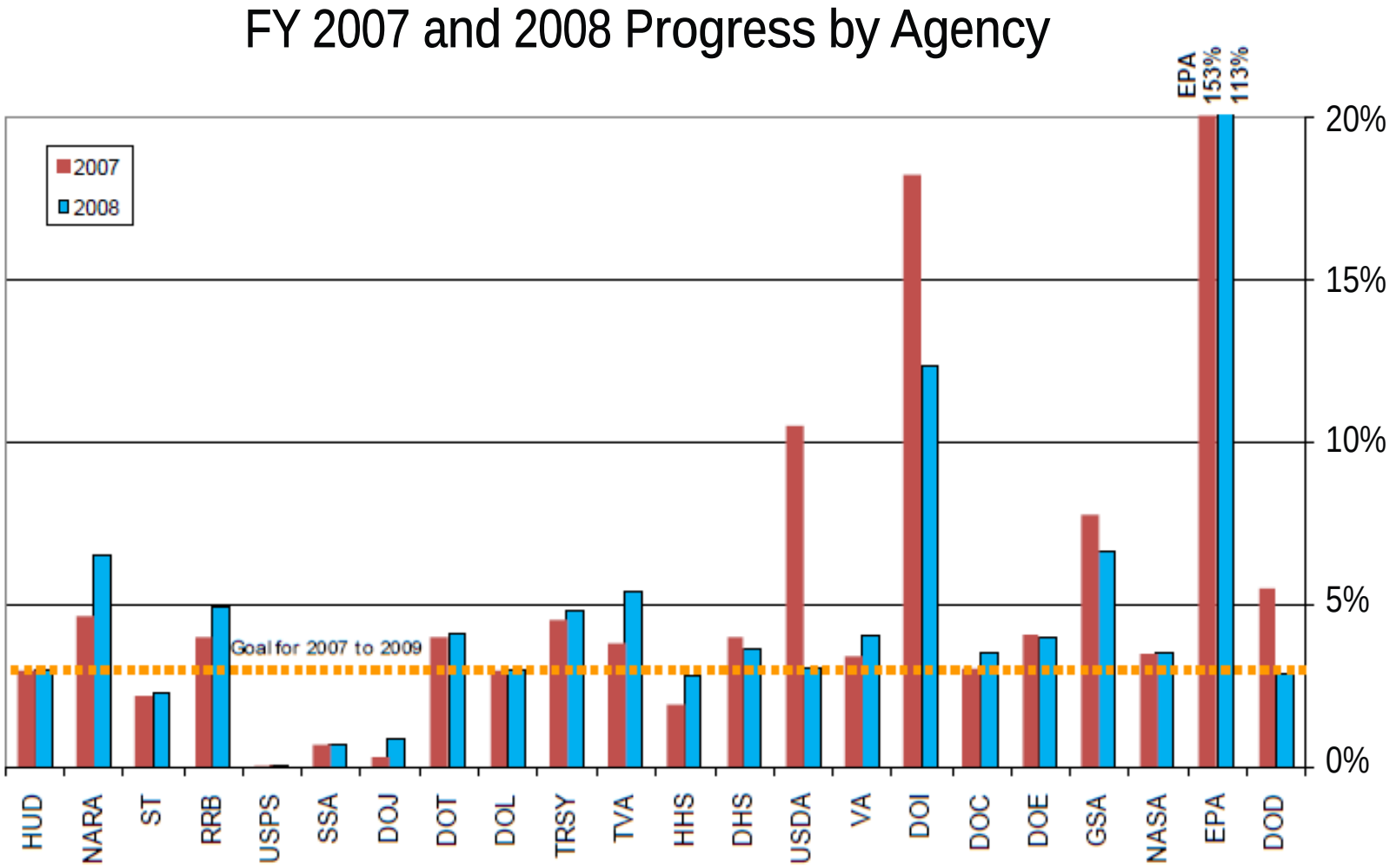


Options for Meeting the Federal Renewable Energy Goal

- On-site renewable energy project
  - On-site renewable energy project owned by ***Federal agency***, implemented using appropriations
- On-site renewable energy project
  - Implemented through energy savings performance contracts (ESPCs) or utility energy service contracts (UESCs)
- On-site renewable power purchase agreement (PPA)
  - On-site renewable energy project owned by a ***private entity*** with the electricity purchased by the Federal agency
- **Purchasing renewable power in a competitive electricity market**
- **Buying renewable power through a utility green pricing program**
- **Buying renewable energy certificates (RECs)**

This webinar covers the last 3 options.

Benefits of Renewable Power/ REC Purchases

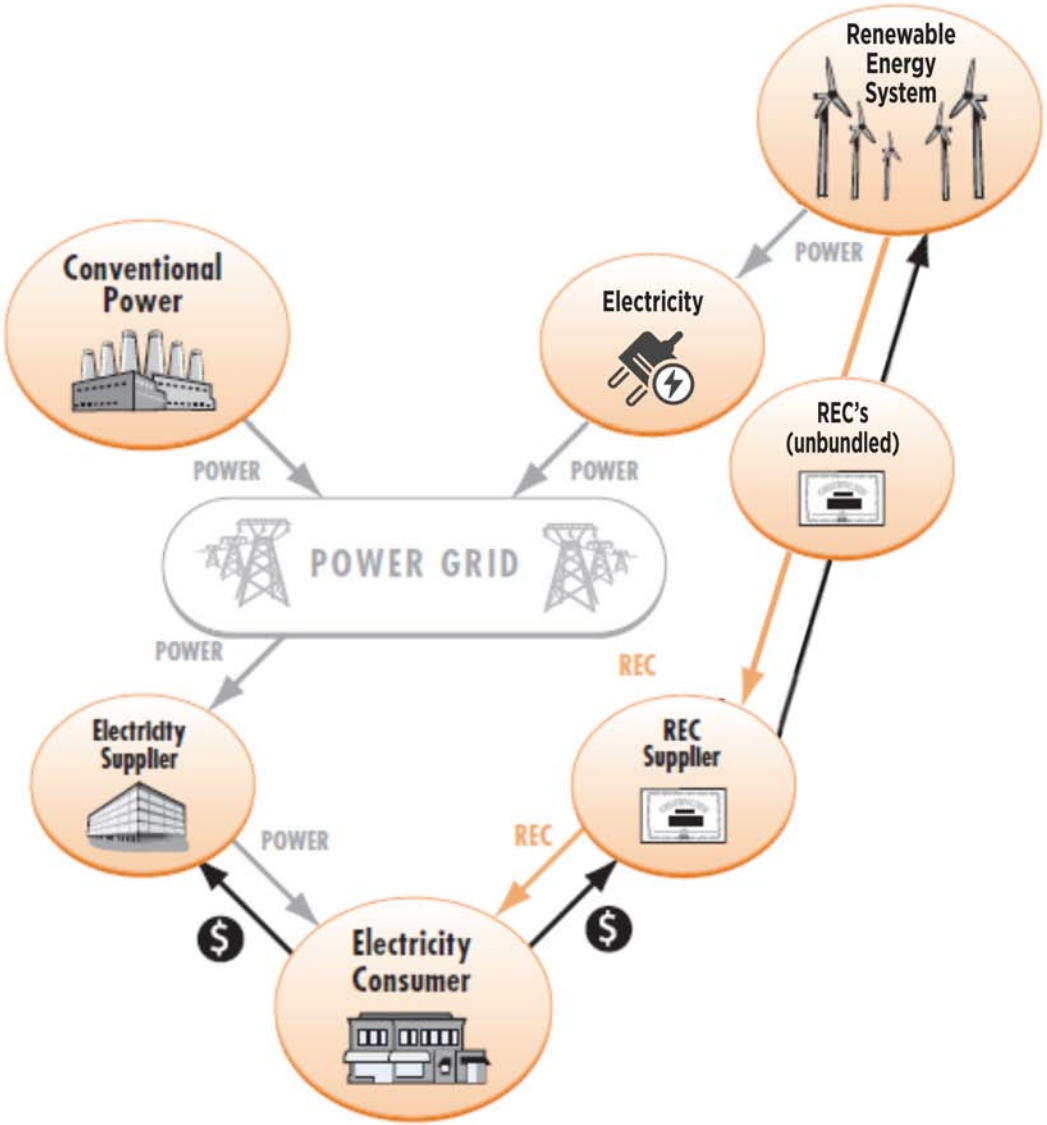
- Alternative if on-site renewables are not viable
- Relatively easy to acquire
- No systems to maintain
- Meet Federal renewable energy requirements and GHG goals
  - EPAct 2005
  - E.O.13423
  - E.O.13514
- Minimal water use for renewables versus conventional electricity generation

Note: *FAR Part 23.2 (Energy and Water Efficiency and Renewable Energy) and FAR Part 23.7 (Contracting for Environmentally Preferable Products and Services) may be beneficial.*

Renewable Energy Certificates (RECs)

- Also known as:
  - Renewable Energy Credits
  - Green Tags
  - Tradable Renewable Certificates
  - Green Energy Certificates/Credits
  - Etc.
- Renewable energy systems produce two distinct products that can be unbundled and sold separately:
  - Generic electricity (sold into the local grid)
  - RECs (the renewable/environmental attributes of the power generated from renewable electric plants)

Renewable Energy Certificates (RECs)

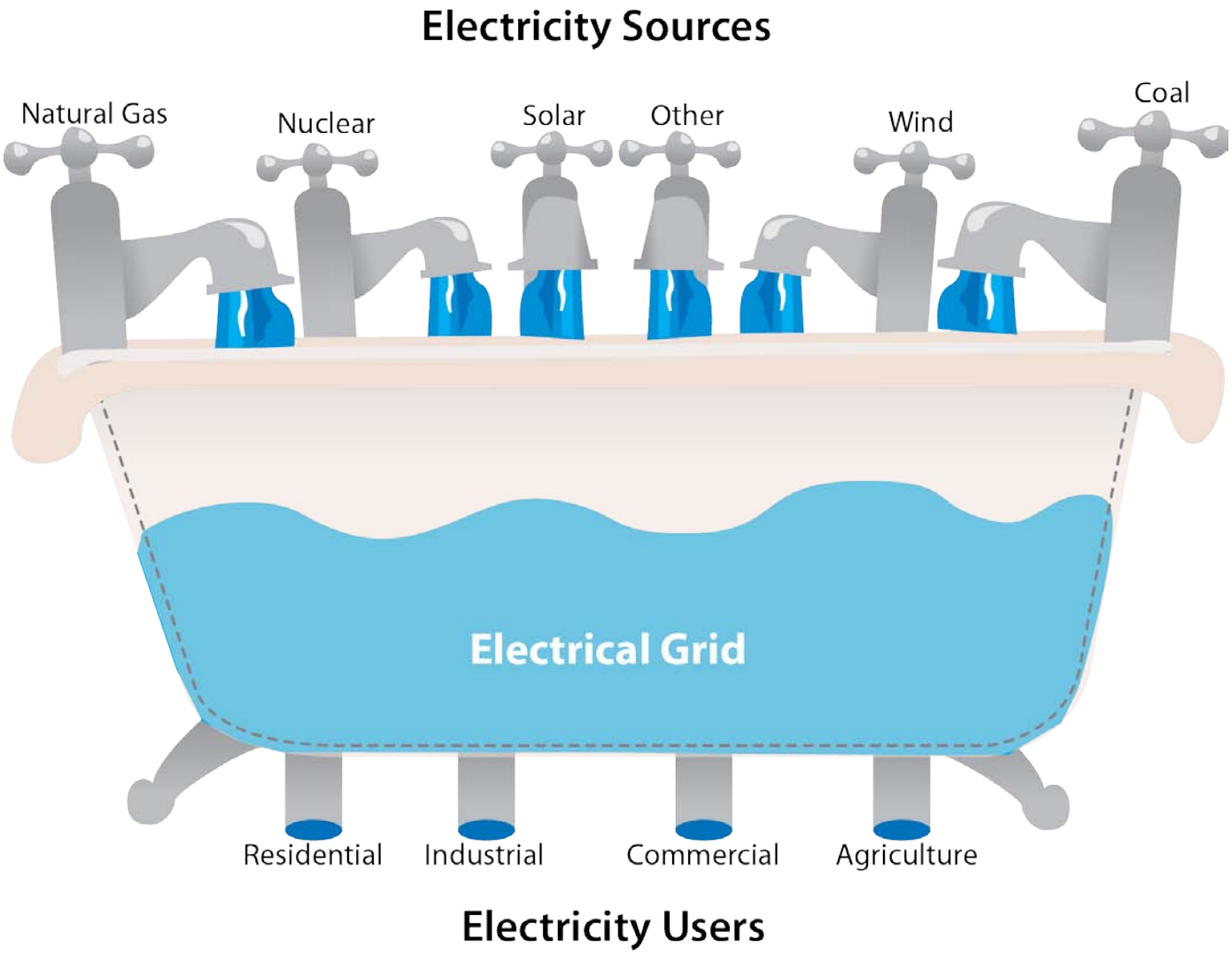


Purchasing Renewable Power in Competitive Electricity Markets

Purchasing Renewable Power in Competitive Electricity Markets

- In a competitive electricity market, electricity customers can choose their electricity supplier and are not limited to their local utility (similar to choosing a long distance phone provider).
  - Purchasing renewable power refers to selecting an electricity supplier that provides a product that includes some percentage of renewable power.
  - Requires that the site switch from their current utility provider to an alternative electricity supplier (may be the utility company's subsidiary).
  - Only available in a limited number of states.
- Best if the renewable power plant is within your electric region.
  - Some renewable suppliers bundle electricity with RECs purchased separately. These RECs may not come from a renewable plant in your region.
- The renewable electricity goes into the local grid.
  - Analogy: A bathtub with many faucets (different electricity plants) and many drains (electricity users such as your site).

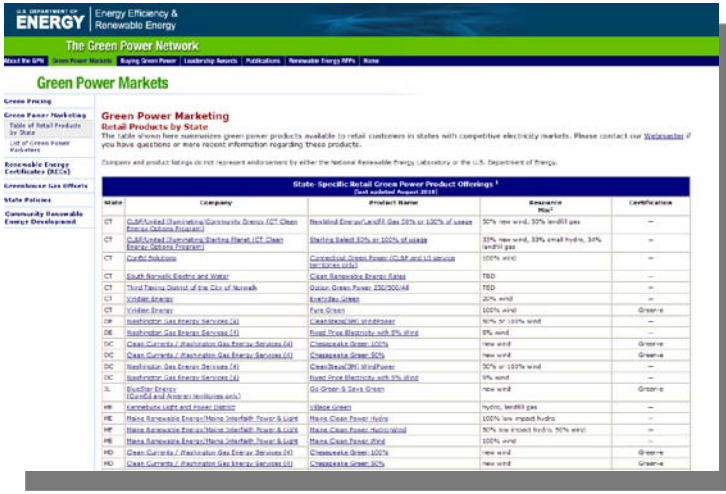
Power Grid Analogy



Purchasing Renewable Power in Competitive Electricity Markets

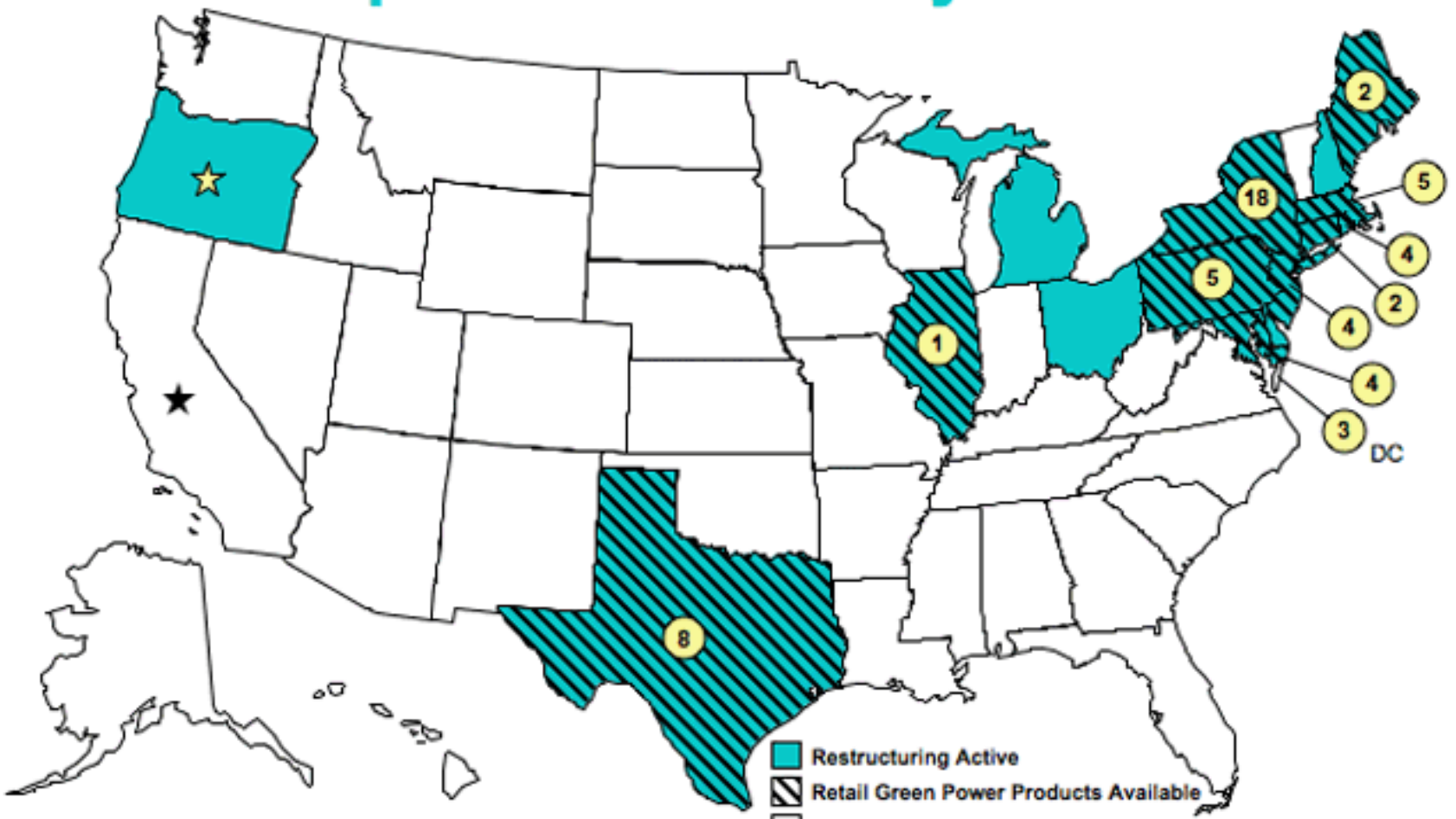
- Competitive acquisition rules apply.
  - Procurement options include General Services Administration (GSA) and Defense Logistics Agency (DLA) Energy [formerly Defense Energy Support Center (DESC)].
  - FAR Part 12 (Commercial Items) is typically used for all electricity purchases (renewable or conventional) with a contract limit of 5 years.
    - DOD sites can use DFARS 17.175 for a 10-year renewable contract.
  - Western Area Power Administration (Western) may be able to assist Federal agencies in their service territory.

- Premiums vary significantly depending on product (type and percentage of renewable energy) and conventional electricity market prices.
  - Competitive renewable power products listed at http://apps3.eere.energy.gov/greenpower/markets/marketing.shtml?page=1



- Very few recent Federal examples exist due to:
  - Limited opportunities.
  - Many renewable power products are actually conventional power bundled with national RECs.

Green Power Marketing Activity in Competitive Electricity Markets*



* Represents bundled renewable electricity products available to residential and small commercial customers.

Source: National Renewable Energy Laboratory (September 2008)

Purchasing Renewable Power in Competitive Electricity Markets

- GSA purchases:
  - EPA: Richmond, California, in 1999
  - GSA: Region 7, Texas, in 2008
  - New York approximately 2004 through present

- DLA Energy purchases:
  - Army: Washington, D.C., in 2002
  - NASA: Johnson Space Center, Texas, starting in 2002
    - 5% renewable through a 3-year contract
  - DOE: West Valley, New York, starting in 2003
    - 10% renewable through a 3-year contract

EPA: Richmond, CA

- GSA issued request for proposals (RFP) on behalf of EPA
- Requested 100% renewable power (~1.8 million kWh/year)
- Sacramento Municipal Utility District (SMUD) selected
- 3-year contract with 3-year renewal option signed in June 1999
  - 10% initial premium with a premium cap of 1¢/kWh
  - Converted to REC contract and price reduced to 0.4¢/kWh
- First Federal100% renewable power purchase
  - 60% from existing geothermal
  - 40% from new landfill gas plant online after contract signed (Fall 1999)

EPA: Richmond, CA Press Conference

GSA: Region 7, TX

- June 2008: GSA Region 7 (R7) conducted a competitive electricity procurement for a minimum of 50% wind
  - Prices competed through a GSA run reverse auction (bid prices go down rather than up)
  - Allowed GSA R7 to limit the premium that energy suppliers charge for renewable energy
- Buy involved 103 Federal buildings in deregulated parts of Texas
- Approximately 130 million kWh/year
- 5-year contract for 50% wind energy covering three of four GSA service areas included in the procurement
- Prices were competitive and only nominally higher than those awarded 3 years earlier for 95% conventional generation and 5% renewable generation

Army: Washington, D.C.

- DLA Energy issued the RFP on behalf of the Army in 2002
- Covered the following Washington, D.C. sites:
  - Walter Reed Army Medical Center
  - Fort McNair
  - Adelphi Laboratories
- 2-year contract
- 19 million kWh
  - 5 million kWh wind
  - 14 million kWh landfill gas
- Approximately 8% of total load
- Partnership between Community Energy (the renewable provider) and Washington Gas (the electricity provider)

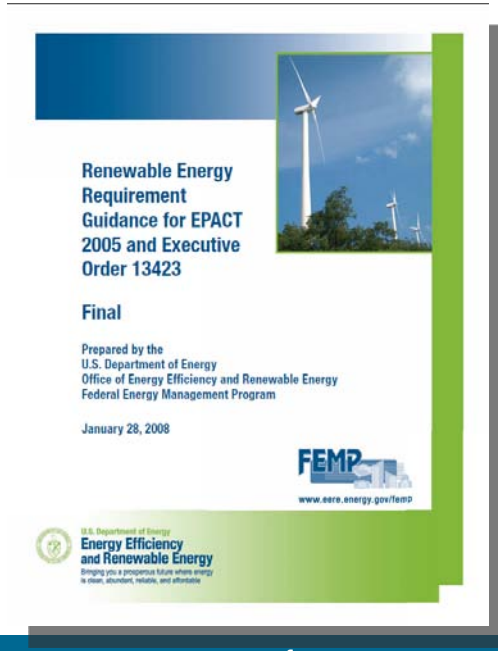
Army: Washington, D.C. Press Conference

Purchasing Renewable Power in Competitive Electricity Markets

- Questions to determine the best option for your site:
  - Is your facility in a state with a competitive electricity market?
  - Are there known renewable power products?
  - Could you save money with a long-term renewable contract or could you stabilize volatile electricity prices?
  - Does your site already have an electricity contract with an alternative supplier?
    - If so, when does it expire? It may be possible to modify an existing contract to include renewables.
    - If not, what are GSA and/or DLA Energy RFP plans for the state?

Renewable Power Specifications

- Desired amount of renewables
  - Percentage
  - Designate certain accounts to be 100% renewable
- Type of renewables desired
  - At a minimum, ensure that the EPAct 2005 renewable definition is met
- Contract length
- Renewable plant online date
  - "New" = Placed into service after January 1, 1999, per E.O. 13423 requirement
- Verification and audit requirements to ensure you get what you paid for and that there is no "double counting"
  - Renewables being used to meet a state renewable portfolio standard (RPS) do not count towards Federal goals
  - More information is available in the FEMP Renewable Guidance (Section 3.3.5: Page 12)
    - www.femp.energy.gov/pdfs/epact05_fedrenewenergyguid.pdf



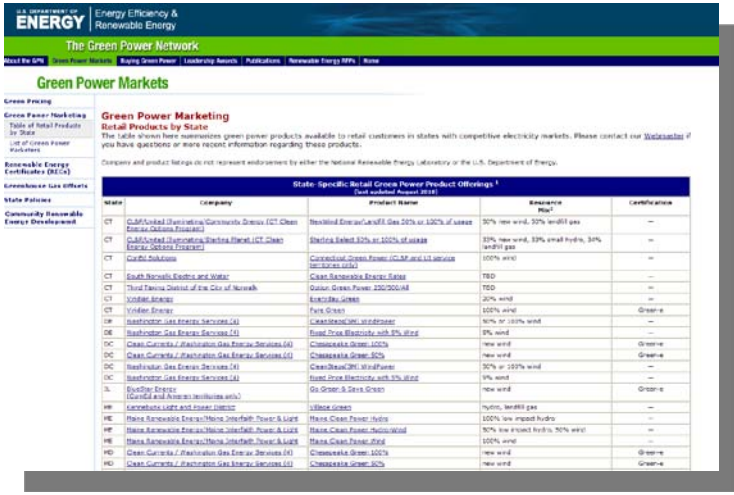
Regulated Utility Green Pricing Programs

Regulated Utility Green Pricing Programs

- Regulated utility green pricing programs are voluntary programs that allow customers to purchase renewable power from their utility, usually at a premium.
  - Utilities offer these programs for a variety of reasons (interest in developing renewable power, customer interest, Commission requirements, etc.).
  - Best programs are those that exempt renewable customers from fuel cost adjustments often included in electric rates to reflect the varying natural gas and other fuel costs.
  - Utilities use a variety of methods to provide renewable power through their green pricing programs:
    - Own renewable power plant(s)
    - Purchase bundled renewable power
    - Purchase RECs

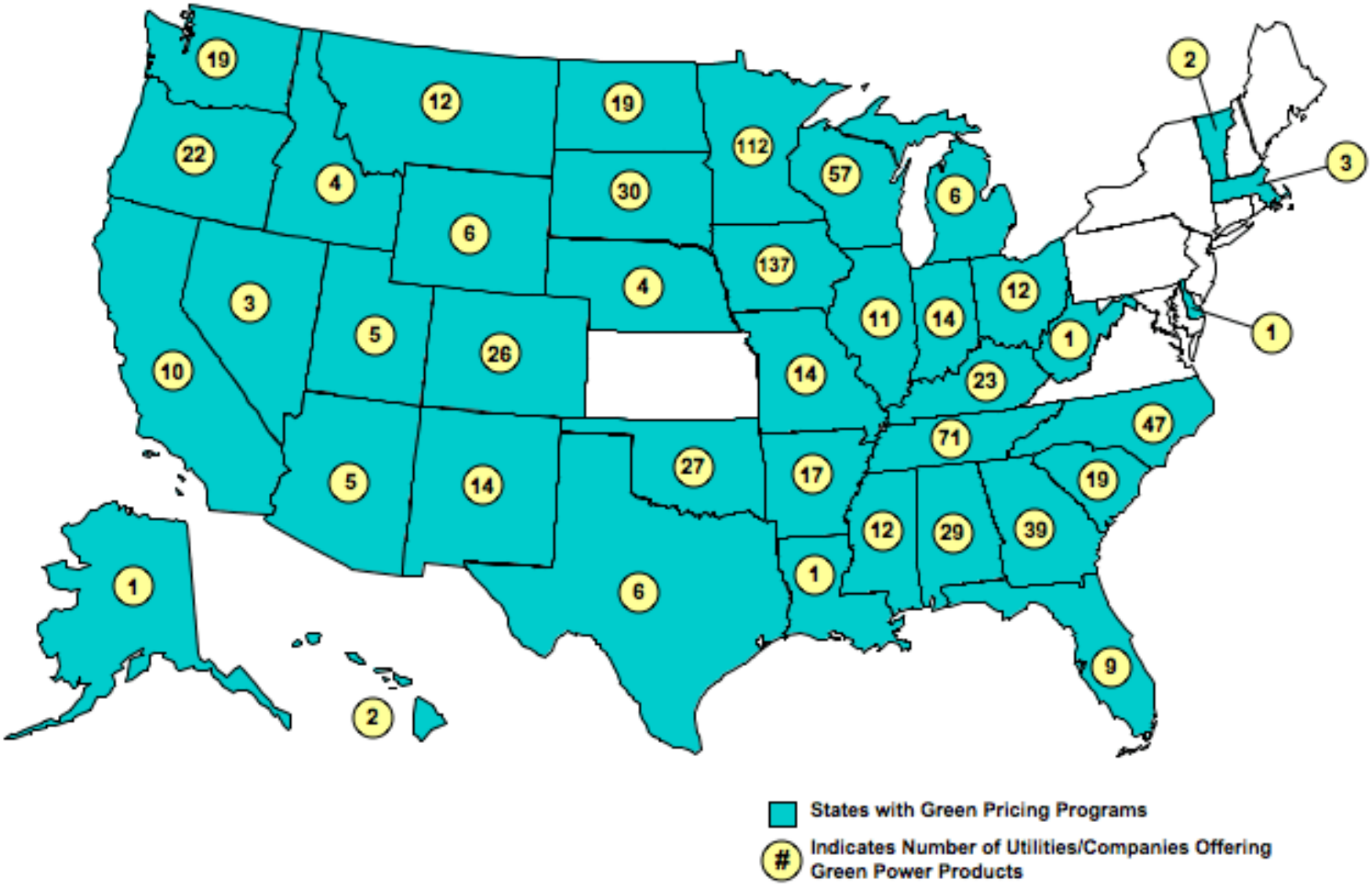
Regulated Utility Green Pricing Programs

- Green pricing product prices vary – usually over 1¢/kWh
  - Price and utility program information by state is available at http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml?page=1



- While there are green pricing programs in most states, few Federal examples exist.
  - Sites should consider supporting their local utility program, if available.
- Competitive procurement not required.
- Contract requirements vary.
  - May be able to use a GSA Areawide Contract Exhibit.

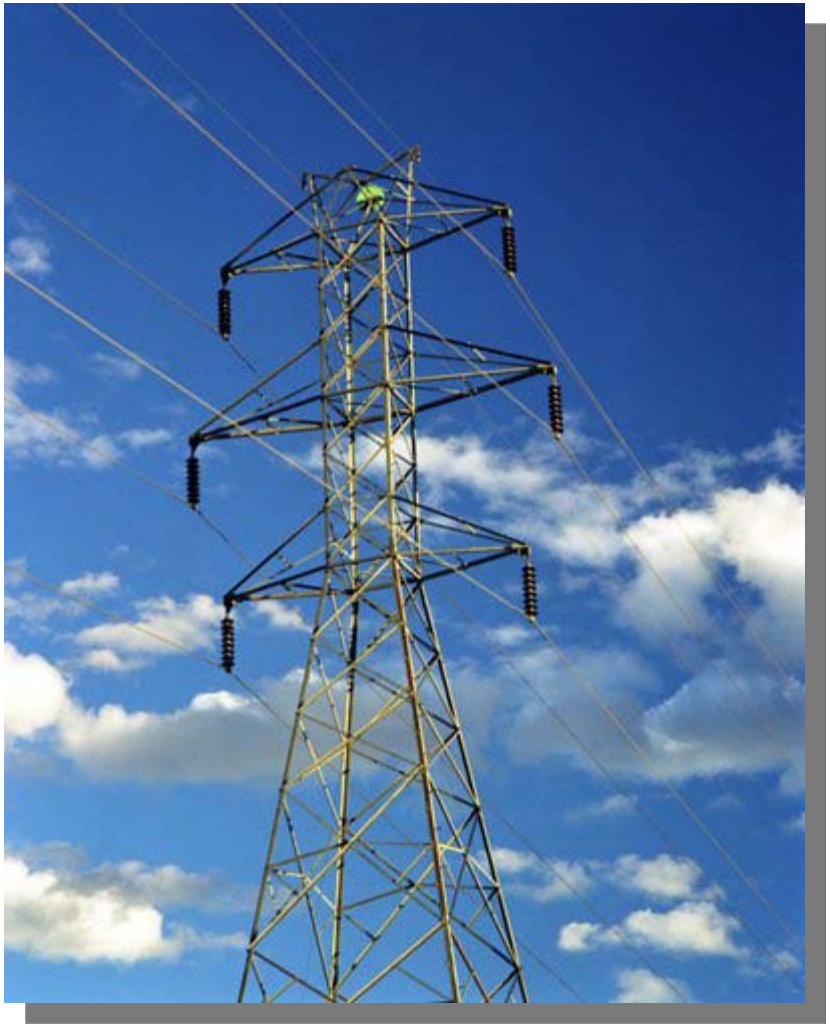
Utility Green Pricing Activities



Source: National Renewable Energy Laboratory (September 2008)

Regulated Utility Green Pricing Programs

- Examples of regulated utility green pricing programs:
  - Colorado Wind Purchase Initiative (2000)
  - Pacific Northwest National Laboratory (PNNL) Washington State (from 2003 to 2009)



Colorado Wind Purchase Initiative

- Partnership to encourage Federal agencies to purchase wind power
- In 2000, approximately 30 Federal agencies signed up for an equivalent of 10 MW
- 15 Federal agencies fulfilled commitment (4 MW)
- Purchased WindSource from Xcel Energy
- 2.5¢/kWh premium with fuel cost adjustment exemption

Colorado Wind Purchase Initiative Press Conference (4/27/00)

Participating Agencies with Former Secretary of Energy Bill Richardson and Group of Children

PNNL Utility Green Pricing Program

- Pacific Northwest National Laboratory worked with their utility, City of Richland, to develop a green pricing program.
- PNNL purchased wind power through the resulting program from FY 2003 – 2009.
- Averaged 6,576,000 kWh/year.
- Premium is $0.011/kWh.
- Renewable product was also available to other customers.

Regulated Utility Green Pricing Programs

- Questions to ask to determine the best option for your site:
  - Does your serving utility offer a renewable product? If not, you need to explore other options or convince the utility to develop a program.
  - What renewable product do they offer and what is the premium?
  - Does the renewable product include a fuel cost adjustment exemption?
  - Is your utility open to negotiation for a lower price and/or fuel cost adjustment exemption?
  - Is there a state renewable portfolio standard (RPS)? If so, what documentation will they provide stating that the renewables being used for their product is not also being used to meet the state RPS requirements (to ensure that your purchase will count toward Federal goals).

Renewable Power Sales and Number of Programs by State

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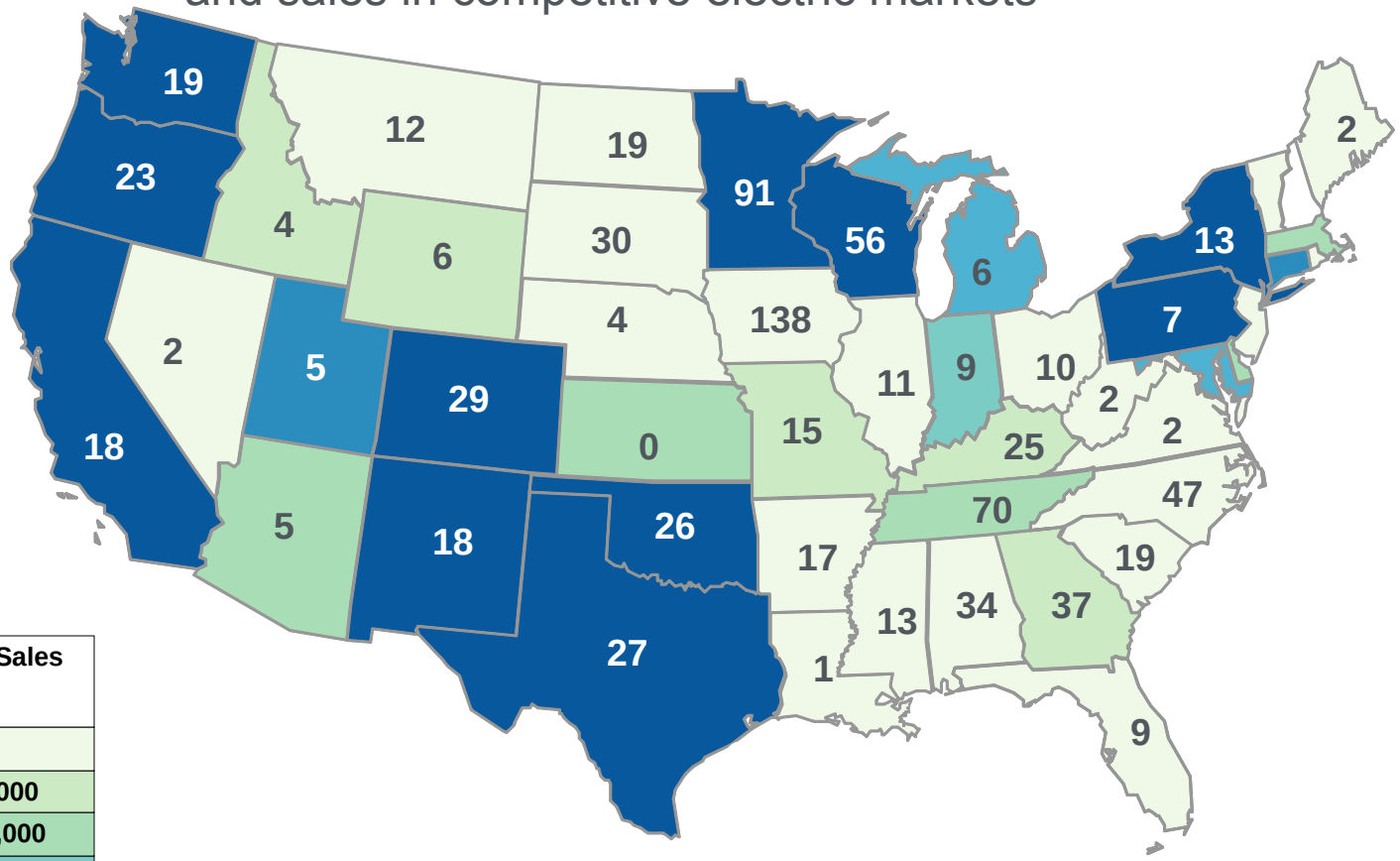
Sales and program figures include both utility green pricing programs and sales in competitive electric markets



Green Power Sales (MWh)
< 35,000
35,000 – 70,000
70,000 – 105,000
105,000 – 140,000
140,000 – 175,000
175,000 – 205,000
> 205,000

Sources: Sales data (2009 data) EIA Annual Electric Utility Data – EIA-861
http://www.eia.doe.gov/cneaf/electricity/page/eia861.html
Number of Programs – DOE Green Power Network http://greenpower.energy.gov
http://apps3.eere.energy.gov/greenpower/markets/marketing.shtml?page=4

Renewable Energy Certificates

Renewable Energy Certificates (RECs)

- Also known as:
  - Renewable Energy Credits
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  - Etc.
- Renewable energy systems produces two distinct products that can be unbundled and sold separately:
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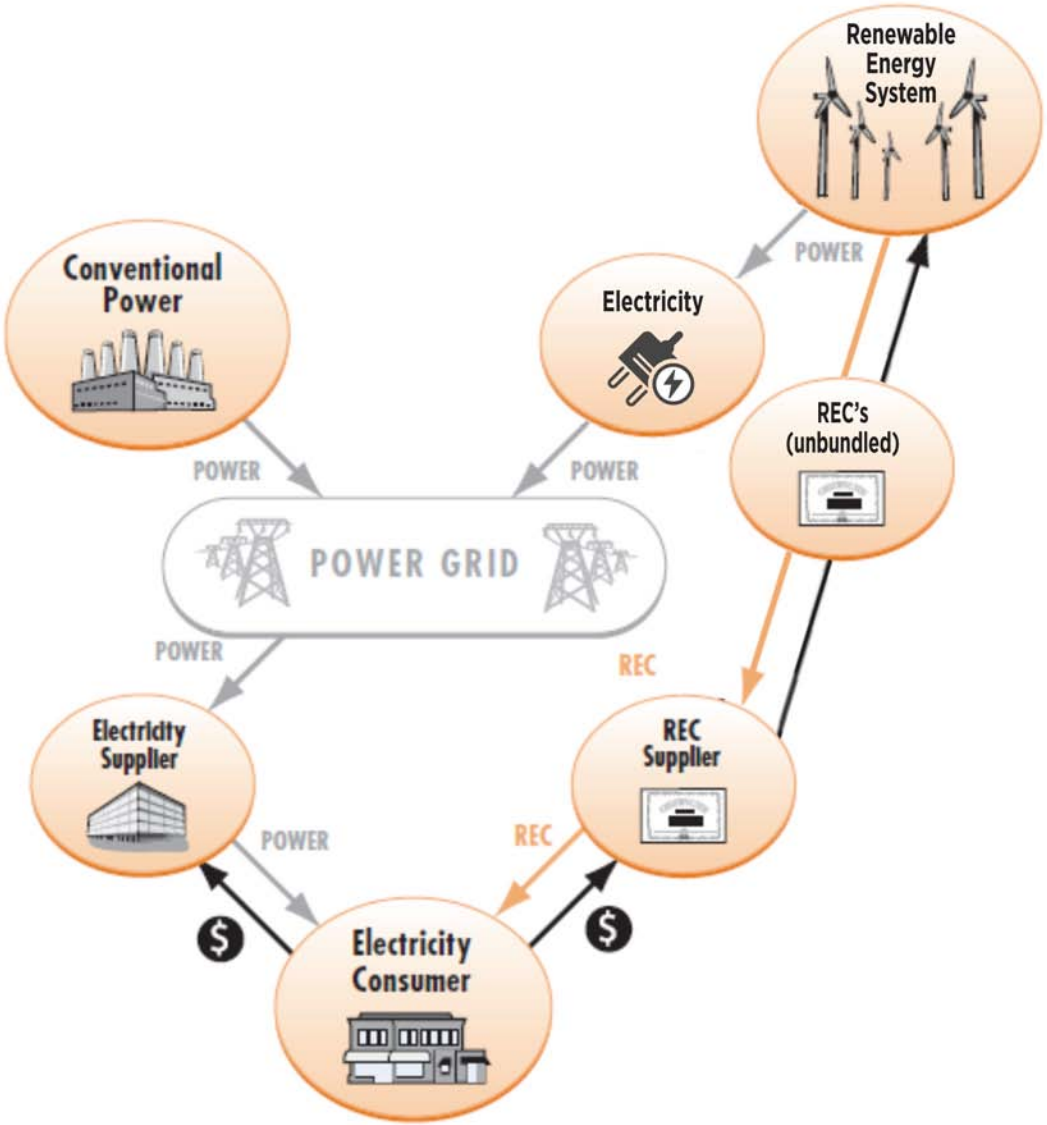
Renewable Energy Certificates (RECs)



Renewable Energy Certificates (RECs)

- RECs are the renewable attribute of the electricity production only.
  - RECs are “unbundled” from the physical electricity.
- RECs come from renewable energy projects all over the country and a variety of renewable resources.
- All GHG emissions and other environmental attributes should be included.
- Location and type of renewable energy project supplying the RECs is important for GHG reporting purposes.

Renewable Energy Certificates (RECs)

- ***Voluntary market:*** Supplies RECs to Federal agencies, corporations, and individuals interested in supporting renewable projects.
  - Federal agencies buy RECs from the voluntary market.
- ***Compliance market:*** Used to meet state renewable portfolio standard (RPS) requirements. Some states have solar and other specific technology requirements
  - Compliance REC prices (especially solar) are much higher than voluntary REC prices since compliance RECs are mandatory and solar is more expensive.
  - RECs from a Federal on-site project may be sold (usually by the private developer owner) into the compliance market. In this case, the Federal agency needs to purchase replacement RECs (from voluntary market) to get credit towards the Federal renewable energy goal.

Renewable Energy Certificates (RECs)

- A double bonus exists for renewable energy projects on Federal or Native American land.
  - The double bonus is for Federal renewable energy goal reporting purposes only – there are not twice as many RECs generated.
  - The double bonus counts for Federal renewable energy goal reporting only; RECs cannot be doubled for GHG reporting

REC Advantages

- RECs have no physical constraints and can come from any renewable energy project located in the United States.
  - No transmission or ancillary services are required.
- Utility providers and bills are not changed.
- RECs can be used for a leased facility.
- RECs can aggregate multiple sites.
  - REC purchases are often made at the agency level
- RECs are an option if no on-site renewable energy project opportunities exist and/or where renewable power delivery is restricted because of physical or institutional barriers.
- RECs encourage future renewable development.

REC Disadvantages

- RECs do not offer protection against fuel price volatility.
- REC costs are in addition to utility costs.
- RECs are not a long term method for meeting the Federal renewable energy goal.
  - Most contracts are only 1-5 years
- Costs are not an investment in facility infrastructure development.
- There is no guarantee of renewable energy development in your region (unless you limit renewable power plant location used to supply the RECs to your state/region).

REC Pricing

- Current national, voluntary market REC price for any renewable technology is less than 0.1¢/kWh ($1/MWh).
- REC prices depend on renewable resource type, location, and renewable project online date.
  - Federal agencies must use **50% "new"** renewables to meet the Federal renewable energy goal.
    - New is defined as placed into service after January 1, 1999.
    - Old RECs (from any renewable plant that was placed into service before January 1, 1999) are significantly cheaper than new RECs.
- Difficult to predict future REC prices due to uncertain policy landscape.

REC Specifications

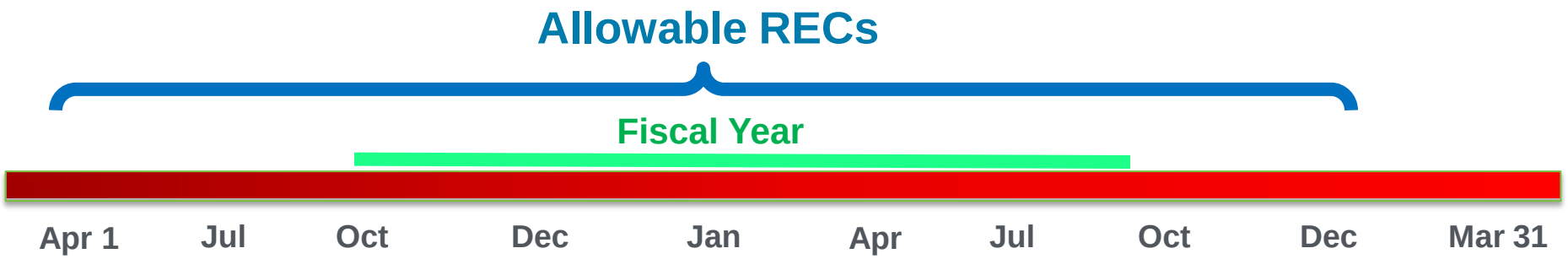
- Desired amount:
  - Quantity in kWh
  - $ amount (bidders indicate kWh available for the available funding)
- Renewable type:
  - Ensure EPAct 2005 renewable energy definition is met
- Renewable project online date:
  - Is the REC new or old
- Location of renewable project used to supply the RECs
  - GHG emission reduction benefits vary by location depending on the mix of power generation resources in the region (make sure to ask for ZIP Code)
  - Support local renewable energy projects

REC Specifications

- Contract length
- REC delivery date:
  - No sooner than xx date to ensure budget will be available by delivery date
  - No later than xx date to ensure renewable type and location is known in time for annual reporting
- Any unique specifications:
  - Renewable type restrictions
  - Use for LEED certification
  - Other
- Verification and audit requirements to ensure you get what you paid for and there is no double counting:
  - No RECs being used to satisfy the requirements of a state RPS may be used by agencies to meet Federal renewable energy goals

Vintage

- Renewable Guidance, Section 3.3.4 “Vintage” Requirements:
  - Vintage refers to the date (month/year) when the RECs were generated (not to be confused with New vs. Old).
  - Allows RECs from 6 months before the contract year and 3 months after the contract year.
  - Fiscal Year 2011: RECs are allowable from April 1, 2010, (6 months prior to the beginning of FY 2011) to December 31, 2011, (3 months after the end of FY 2011).
  - RECs from April through September can count toward the current or future fiscal year (providing flexibility if exact requirement is not known at time of purchase).



REC Purchasing Options

- Defense Logistics Agency (DLA) Energy
  - Formerly Defense Energy Support Center (DESC)
- General Services Administration (GSA)
- Western Area Power Administration (Western)

***Note that competitive acquisition rules apply.*

REC Purchasing: DLA Energy

- DLA Energy issues periodic REC RFPs throughout the year for both civilian and DOD sites.
- No fee.
- Federal agency pays the selected REC provider.
- Federal agency must provide funding mechanism prior to award (line of accounting, credit card, etc.).
- DLA Energy will not make an award unless the customer agrees with the prices received.
- Contacts:
  - Andrea Kincaid: 703-767-8669, andrea.kincaid@dla.mil
  - Cindy Ralph:703-767-8566, cynthia.ralph@dla.mil

REC Purchasing: GSA

- GSA issues periodic REC RFPs, typically Spring through end of fiscal year.
- Can include renewable energy requirements in electricity procurement (as either bundled renewable power or RECs).
- No fee.
- Federal agency pays the selected REC provider.
- GSA will not make an award unless the customer agrees with the prices received.
- MOA or fund certification.
- Contact:
  - Ken Shutika: 202-260-9713, ken.shutika@gsa.gov

REC Purchasing: Western

- Conducted through Western's Federal Renewable Resources for Federal Agencies (RRFA) Program.
- Annual REC procurement.
- Statement of intent (usually due in May).
  - Good faith non-binding agreement.
  - Authorizes Western to seek RECs on the Federal agency's behalf.
  - REC specifications.
- Interagency agreement:
  - Commitment of funding availability for the current year.
  - Every effort made to secure future appropriations.
  - Agreements follow Economy Act requirements, including a determination and finding (D&F).
- Federal agency pays the selected REC provider.
- Nominal $300 annual fee for contract administration.
  - FEMP funding has historically covered procurement costs.
- Contact:
  - Randy Manion : 720-962-7423, manion@wapa.gov

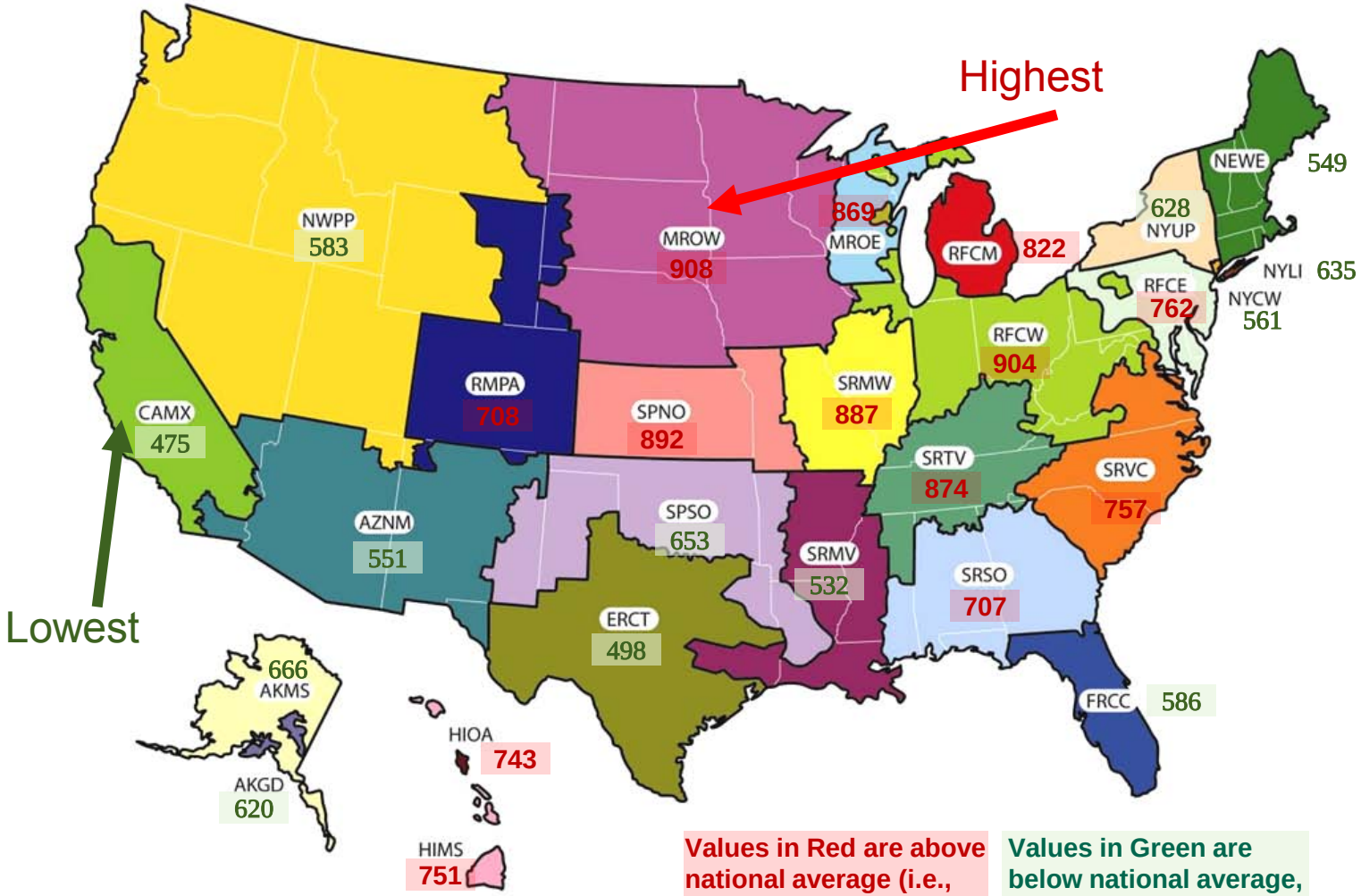
Counting Renewable Purchases Toward GHG Reduction Goals

Renewable Power/REC Purchases and Greenhouse Gas Emissions

- RECs and renewable power purchases can be used to offset Scope 2 greenhouse gas (GHG) emissions.
  - Use eGRID non-baseload GHG emission rates to determine GHG benefit (see http://cfpub.epa.gov/egridweb/ghg.cfm).
  - Emissions factors are listed in the *Federal GHG Accounting and Reporting Guidance Technical Support Document (TSD)* (Table D-8).
    - http://www.whitehouse.gov/sites/default/files/microsites/ceq/technical_support_document_1.pdf
  - Both location and renewable resource type are important.
  - Separate line in the annual sustainability data reporting spreadsheet for each renewable resource type and location (ZIP Code).
  - Biomass:
    - Considered GHG neutral except for methane and nitrous oxide.
    - CO_2 emissions are tracked but not included in GHG targets.
    - Emission rates vary depending on biomass type.
    - Check *Federal GHG Accounting & Reporting Guidance TSD* (Tables D-4 and D-5) for appropriate emission rates.

2010 eGRID Regions and CO_2 Equivalent Emission (MT/GWh) – Non Baseload

eGRID2010 Non-Baseload Values, 2007 Generation



	2005	2007
CAMX:	492	475
ERCT:	509	498
SRMV:	572	532
NEWE:	608	549
AZNM:	546	551
NYCW:	694	561
NWPP:	616	583
FRCC:	599	586
AKGD:	670	620
NYUP:	690	628
NYLI:	687	635
SPSO:	628	653
AKMS:	663	666
U.S.:	721	692
SRSO:	812	707
RMPA:	737	708
HIOA:	758	743
HIMS:	774	751
SRVC:	816	757
RFCE:	833	762
RFCM:	770	822
MROE:	846	869
SRTV:	911	874
SRMW:	958	887
SPNO:	989	892
RFCW:	909	904
MROW:	985	908

Values in Red are above national average (i.e., SRVC at 812)

Values in Green are below national average, (i.e., SRMV at 572)

Summary & Resources

Option Comparison

Issue	Utility Green Pricing	Renewable Power in Competitive Market	RECs
Supplier	Utility	Competitive electricity supplier	REC supplier
Option availability	Depends on the utility	Available only in a state with a competitive electricity market	Available anywhere
Billing	Typically an extra line item on utility bill	May be billed separately or added to the utility bill	Separate bills (utility bill remains the same)
Protection from fuel price volatility	Depends on the utility program	Yes	No

Option Comparison

Issue	Utility Green Pricing	Renewable Power in Competitive Market	RECs
Transaction/ procurement requirements	Transaction required for each site; Utility may allow single contract and/or bill for multiple sites within their service territory	Sites within a state may be included in a single procurement	One procurement for many sites across the country is possible
Leased facility	Easy if agency is responsible for utility bill; Otherwise, must coordinate with the lessor	Easy if agency is responsible for utility bill; Otherwise must coordinate with the lessor	Yes

Summary

- Federal agencies are encouraged to explore on-site renewable energy project opportunities.
- If there are limited or no on-site opportunities, agencies should explore utility green pricing and competitive renewable power purchase opportunities.
- RECs can help an agency meet Federal renewable energy goals if other options are limited or do not exist.

Additional Resources

- Federal Energy Management Program (FEMP)
  www.femp.energy.gov
- FEMP Renewable Energy
  www.femp.energy.gov/technologies/renewable_energy.html
- Renewable Energy Requirement Guidance for EPAct 2005 and E.O. 13423
  www.femp.energy.gov/pdfs/epact05_fedrenewenergyguid.pdf
- FEMP Renewable Energy Contacts
  www.femp.energy.gov/technologies/renewable_contacts.html
- FEMP Purchasing Renewable Power
  www.femp.energy.gov/technologies/renewable_purchasingpower.html
- FEMP Power Purchase Agreements
  www.femp.energy.gov/financing/power_purchase_agreements.html
  (Includes a link to Alternative Financing Options on-demand webinar)
- FEMP Training Database
  www.femp.energy.gov/training

Additional Resources

- Green Power Network
  http://apps3.eere.energy.gov/greenpower/
- Guide to Purchasing Green Power
  www.femp.energy.gov/pdfs/purchase_green_power.pdf
- DLA Energy
  http://www.desc.dla.mil/DCM/DCMPage.asp?pageid=589
- GSA Energy and Water Conservation Overview
  www.gsa.gov/portal/content/104491
- Western Renewable Resources for Federal Agencies
  www.wapa.gov/powerm/pmtags.htm
  (See program brochure at bottom of website.)
- EPA Green Power Partnership
  www.epa.gov/greenpower/

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